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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/668,117	09/22/2003	Toshitaka Mori	1300-000003	7649

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EXAMINER	
ZIMMERMAN, GLENN	

ART UNIT	PAPER NUMBER
2879	

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/668,117	MORI ET AL.	
	Examiner	Art Unit	
	Glenn Zimmerman	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-12 is/are pending in the application.

4a) Of the above claim(s) 7-11 is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-6 is/are rejected.

7)☒ Claim(s) 12 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 22 September 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 0704.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-6 and 12, drawn to a display element, classified in class 313, subclass 503.

II. Claims 7-11, drawn to a display elements, classified in class 427, subclass 66.

The inventions are distinct, each from the other because of the following reasons:

Inventions Group II and Group I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case one could form the second electrode on a sacrificial substrate and then form the luminescent layer on the second electrode. Next one could put the luminescent layer and second electrode layer onto the corrosion-resistant charge injection accelerating layer which includes metal layer and substrate. Next etch or dissolve away the sacrificial substrate. Also one could perform the forming of the metal layer and the patterning all in one step i.e. at the same time. Also one could pattern the metal layer after the corrosion-resistant charge injection accelerating layer is on the metal layer.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Michael Hilton on June 8, 2005 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-6 and 12. Affirmation of this election must be made by applicant in replying to this Office action. Claims 7-11 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

Claim 12 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. See MPEP § 608.01(n). Accordingly, the claim 12 has not been further treated on the merits. Claim 12 depends from both claim 1 and 7.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2 and 4-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Morii U.S. Patent 6,853,130.

Regarding claims 1, Morii discloses a display element **(Fig. 1; col. 1 lines 9-11)** comprising a first electrode **(anode ref. 2)**, a luminescent layer **(light-emitting layer ref. 3)**, a second electrode **(first cathode layer or second cathode layer ref. 5 or 6)**, and a substrate **(substrate ref. 1)**, the first electrode comprising a metal layer **(col. 4 lines 24-27; choose Ni or Ir or Pd)** and a corrosion-resistant charge injection acceleration layer, the corrosion-resistant charge injection accelerating layer having been formed by subjecting a surface layer in the metal layer to plasma treatment using an oxygen atom-containing gas **(col. 3 lines 9-20)**. Though a named corrosion-resistant charge injection acceleration layer is might not be mentioned in the Morii reference, the examiner believes that it is there as it is a result of the plasma treatment using oxygen. The examiner notes that in the applicants' specification page 7 that "The corrosion-resistant charge injection accelerating layer is formed by subjecting a surface

of the metal layer formed on the surface of the substrate to plasma treatment (oxidation treatment) using an oxygen atom-containing gas."

Regarding claim 2, Morii discloses the display element according to claim 1, wherein the metal layer is formed of a metal selected from the group consisting of chromium, nickel **(col. 4 lines 24-27; choose Ni)**, tungsten, manganese, indium, tin, zinc, molybdenum, vanadium, titanium, tantalum, niobium, and mixture thereof.

Regarding claim 4, Morii discloses the display element according to claim 1, wherein the first electrode reflects not more than 70% of light in the visible region incident through the second electrode side **(Table 1; col. 8 lines 48-52)**. If they are transmitting move than 70% in the visible regions than they do not reflect more than 70%.

Regarding claim 5, Morii discloses the display element according to claim 1, wherein the corrosion-resistant charge injection **(col. 4 lines 24-26)** accelerating layer has a lower resistivity than the luminescent layer **(col. 5 lines 9-11)**. The examiner notes that one can choose Ir or Pd for the anode. After oxygen plasma treatment there will be left an oxide of the particular metal. The examiner notes that Iridium oxide has a resistivity of $49*10^{-6}$ Ωcm. The examiner notes that platinum oxide has a resistivity of between 100 and 1.000 ohm cm. The examiner notes that PPV poly(phenylene vinylene) has a resistivity of 10^2 Ω m.

Regarding claim 6, Morii discloses the display element according to any one of claims 1 to 5, which is used as an electroluminescent element **(title; col. 1 lines 9-11)**.

Claims 1 and 3 are rejected under 35 U.S.C. 102(e) as being anticipated by Mishima et al. U.S. Patent 6,818,325.

Regarding claims 1, Mishima et al. discloses a display element **(col. 1 lines 5-10)** comprising a first electrode **(claim 1)**, a luminescent layer **(claim 1)**, a second electrode **(claim 1)**, and a substrate **(claim 1)**, the first electrode comprising a metal layer **(col. 19 lines 48-62; choose chromium or nickel or mixtures of these metals, alloys)** and a corrosion-resistant charge injection acceleration layer, the corrosion-resistant charge injection accelerating layer having been formed by subjecting a surface layer in the metal layer to plasma treatment using an oxygen atom-containing gas **(col. 23 lines 20-23; substitute the ITO with chromium or nickel or cr-ni)**. Though a named corrosion-resistant charge injection acceleration layer might not be mentioned in the Mishima reference, the examiner believes that it is there as it is a result of the plasma treatment using oxygen. The examiner notes that in the applicants' specification page 7 that "The corrosion-resistant charge injection accelerating layer is formed by subjecting a surface of the metal layer formed on the surface of the substrate to plasma treatment (oxidation treatment) using an oxygen atom-containing gas."

Regarding claim 3, Mishima et al. discloses a display element according to claim 1, wherein the metal layer comprises a laminate **(col. 19 lines 48-62; choose chromium and nickel and silver and gold mixtures of these metals, alloys)** of one or more alloys and one or more metals. The examiner took the meaning of this claim to be that the alloy laminate have a metal in it from the specification and examples.

Claims 1 and 3 are rejected under 35 U.S.C. 102(e) as being anticipated by Hashimoto et al. U.S. Patent Application Publication 2001/0051487 A1.

Regarding claims 1, Hashimoto et al. discloses a display element **(paragraph 66)** comprising a first electrode **(claim 1)**, a luminescent layer **(claim 1)**, a second electrode **(claim 1)**, and a substrate **(claim 1)**, the first electrode comprising a metal layer **(paragraph 64 anode materials nickel, etc)** and a corrosion-resistant charge injection acceleration layer, the corrosion-resistant charge injection accelerating layer having been formed by subjecting a surface layer in the metal layer to plasma treatment using an oxygen atom-containing gas **(claim 9)**. Though a named corrosion-resistant charge injection acceleration layer might not be mentioned in the Hashimoto reference, the examiner believes that it is there as it is a result of the plasma treatment using oxygen. The examiner notes that in the applicants' specification page 7 that "The corrosion-resistant charge injection accelerating layer is formed by subjecting a surface of the metal layer formed on the surface of the substrate to plasma treatment (oxidation treatment) using an oxygen atom-containing gas."

Regarding claim 3, Mishima et al. discloses a display element according to claim 1, wherein the metal layer comprises a laminate **(paragraph 64 nickel and other metals and alloys thereof)** of one or more alloys and one or more metals. The examiner took the meaning of this claim to be that the alloy laminate have a metal in it from the specification and examples.

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Kobayashi U.S. Patent 6,869,635.

Regarding claims 1, Kobayashi discloses a display element **(title)** comprising a first electrode **(ref. 2)**, a luminescent layer **(ref. 3 light-emitting layer)**, a second electrode **(ref. 5)**, and a substrate **(ref. 1)**, the first electrode comprising a metal layer **(aluminum col. 5 line 45-50)** and a corrosion-resistant charge injection acceleration layer **(col. 5 lines 47-50)**, the corrosion-resistant charge injection accelerating layer having been formed by subjecting a surface layer in the metal layer to plasma treatment using an oxygen atom-containing gas **(col. 5 line 49)**. Though a named corrosion-resistant charge injection acceleration layer might not be mentioned in the Hashimoto reference, the examiner believes that it is there as it is a result of the plasma treatment using oxygen. The examiner notes that in the applicants' specification page 7 that "The corrosion-resistant charge injection accelerating layer is formed by subjecting a surface of the metal layer formed on the surface of the substrate to plasma treatment (oxidation treatment) using an oxygen atom-containing gas."

Claims 1, 2, 5 and 6 are rejected under 35 U.S.C. 102(a) as being anticipated by Hirano WO 02/056641 A1. The examiner will be using US. Patent 6,774,561 as an interpretation of the Hirano WO 02/056641 A1 document as the US Patent claims priority to the Japanese Language WO 02/056641 A1 document.

Regarding claims 1, Hirano discloses a display element **(title; col. 1 lines 30-31)** comprising a first electrode **(col. 3 lines 46-50; ref. 2)**, a luminescent layer **(ref. 6c)**, a second electrode **(ref. 7 or 8)**, and a substrate **(ref. 1)**, the first electrode comprising a metal layer **(col. 3 lines 46-50; ref. 2)** and a corrosion-resistant charge injection acceleration layer **(ref. 3; col. 3 lines 57 and 58; use the same metal to make the**

oxide layer as that used to make the metal layer), the corrosion-resistant charge injection accelerating layer having been formed by subjecting a surface layer in the metal layer to plasma treatment using an oxygen atom-containing gas. The limitation "having been formed by subjecting a surface layer in the metal layer to plasma treatment using an oxygen atom-containing gas" has not been given patentable weight as it is a product by process limitation.

Regarding claim 2, Hirano discloses the display element according to claim 1, wherein the metal layer is formed of a metal selected from the group consisting of chromium, nickel **(col. 3 lines 46-50; ref. 2; choose Ni or Ta or Nb)**, tungsten, manganese, indium, tin, zinc, molybdenum, vanadium, titanium, tantalum, niobium, and mixture thereof.

Regarding claim 5, Hirano discloses the display element according to claim 1, wherein the corrosion-resistant charge injection **(abstract; the oxide having a higher conductivity than the organic layer)** accelerating layer has a lower resistivity than the luminescent layer **(ref. 6; choose the organic layer to only be the emission layer 6c as it writes in the abstract at least an emission layer; therefore choose the least for 6 which is the emission layer 6c)**.

Regarding claim 6, Hirano discloses the display element according to any one of claims 1 to 5, which is used as an electroluminescent element **(col.1 lines 13 and 14)**.

Claims 1, 2, 4 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Hirano et al. Japanese Patent Application Publication 2001-043980. The examiner will

be using US. Patent 6,831,408 as an interpretation of the Japanese Publication as the US Patent claims foreign priority to the Japanese Patent Application.

Regarding claims 1, Hirano et al. disclose a display element **(title)** comprising a first electrode **(ref. A; col. 2 lines 49-67 and col. 3 lines 1-6)**, a luminescent layer **(ref. 103 Alq)**, a second electrode **(ref. K or 12 or 11)**, and a substrate **(ref. 1)**, the first electrode comprising a metal layer **(ref. A; col. 2 lines 49-67 and col. 3 lines 1-6; choose Ni; or Cr col. 5 lines 50-52)** and a corrosion-resistant charge injection acceleration layer **(col. 3 lines 1-6; choose a dual layer with Ni as the one layer and NiO or Chromium oxide as the layer closer to the electroluminescent layer)**, the corrosion-resistant charge injection accelerating layer having been formed by subjecting a surface layer in the metal layer to plasma treatment using an oxygen atom-containing gas. The limitation "having been formed by subjecting a surface layer in the metal layer to plasma treatment using an oxygen atom-containing gas" has not been given patentable weight as it is a product by process limitation.

Regarding claim 2, Hirano et al. disclose the display element according to claim 1, wherein the metal layer is formed of a metal selected from the group consisting of chromium, nickel **(ref. A; col. 2 lines 49-67 and col. 3 lines 1-6; choose Ni)**, tungsten, manganese, indium, tin, zinc, molybdenum, vanadium, titanium, tantalum, niobium, and mixture thereof.

Regarding claim 4, Hirano et al. disclose the display element according to claim 1, wherein the first electrode reflects not more than 70% of light in the visible region incident through the second electrode side **(col. 3 lines 45 and 46; choose 41%)**.

Regarding claim 6, Hirano discloses the display element according to any one of claims 1 to 5, which is used as an electroluminescent element **(ABSTRACT)**.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirano WO 02/056641 A1 in view of Howard U.S. Patent 6,885,147.

. The examiner will be using US. Patent 6,774,561 as an interpretation of the Hirano WO 02/056641 A1 document as the US Patent claims priority to the Japanese Language WO 02/056641 A1 document.

Regarding claim 3, Hirano teaches all the limitations of claim 3, but fail to teach wherein the metal layer comprises a laminate of one or more alloys and one or more metals. Howard in the analogous art teaches a metal layer electrode comprising a laminate of one or more alloys and one or more metals (col. 7 lines 15-24; choose an alloy of tantalum, chromium and nickel or tungsten). Additionally, Howard teaches incorporation of such a laminate of one or more alloys and one or more metals to

improve stability for the anode **(col. 7 line 16)** and the metal alloys will provide a working OLED **(Fig. 4)**.

Consequently it would have been obvious to a person having ordinary skill in the art at the time the invention was made to use a laminate of one or more alloys and one or more metals in the electrode of Hirano, since such a modification would improve stability of the anode and the metal alloys will provide a working OLED as taught by Howard. When these metal alloys are used in the Hirano reference the examiner notes from the Hirano reference from the abstract that the buffer layer is formed from an oxide of the metallic material layer and in this instance that is the alloy and one or more metals of Howard.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sella et al. U.S. Patent 4,511,451 discloses a Device for Preparing Substrates Coated with a Thin Layer of Platinum Oixde and Substrates so Coated. Reference '454 discloses that platinum oxide has a resistivity of between 100 and 1.000 ohm cm. Nakamura U.S. Patent 6,052,271 disclose a Ferroelectric Capacitor Including an Iridium Oxide Layer in the Lower Electrode. Reference '271 discloses that Iridium oxide has a resistivity of $49*10^{-6}$ Ωcm. Gaffney U.S. Patent 5,446,334 disclose a Piezoluminescent, Pyroluminescent Sensor. Reference '334 discloses that PPV poly(phenylene vinylene) has a resistivity of 10^2 Ω m. Takematsu et al. U.S. Patent

Application Publication 2002/0030441 A1 disclose a Method for Selecting Combination of Host Material and Light-emitting Material, and Organic Light-Emitting Device Using Combination Selected Thereby. Howard et al. U.S. Patent Application Publication 2002/0021088 A1 disclose Organic Light Emitting Diode Devices with Improved Anode Stability. Kobayashi U.S. Patent Application Publication 2002/0057052 A1 disclose Method for Manufacturing Organic EL Device, Organic EL Device and Electronic Apparatus. Ueda et al. U.S. Patent Application Publication 2002/0115877 A1 discloses Silicon-Containing Compound and Organic Electroluminescence Device Using the Same. Yamazaki et al. U.S. Patent Application Publication 2003/0062519 A1 disclose Light Emitting Device, Electronic Equipment, and Organic Polarizing Film. Mishima U.S. Patent Application Publication 2004/0046496 A1 disclose Light-Emitting Device and Its Production. Takagi et al. U.S. Patent 4,931,692 disclose a Luminescing Member, Process for Preparation Thereof, and Electroluminescent Device Employing the Same. Reference '692 disclose that treatment in an oxygen plasma is effecti to conduct an oxidation treatment (col. 6 lines 9-12). Sanford et al. U.S. Patent 6,734,636 disclose an OLED Current Drive Pixel Circuit. Many of these references disclose oxygen plasma treatment of anodes, electrodes or cathodes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Glenn Zimmerman whose telephone number is (571) 272-2466. The examiner can normally be reached on M-W 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh D. Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Glenn Zimmerman

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